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any conclusion, this fact at present points to the fauna of this country at the place of origin or aldainic fauna of this series. *Rouilleri* is probably genetically connected with *P. Dumbli*, or some equivalent species, and *P. oxystomum* is similarly connected with *P. Rouilleri.* In both of these, however, it is superseded in the subsequent stages of shell growth by an acute abdomen.

NOTE.—I find from correspondence with Professor Hyatt, (April 25, 1893,) that he has ascertained that the genus *Phacoceras* is distinct from the group to which *dumbli* ought to be referred, and he will give another generic name in his forthcoming report on carboniferous cephalapods, to be printed in the next Annual Texas Report.

THE FORMATION OF DONIPHAN LAKE, IN THE SPRING AND EARLY SUMMER OF 1891.

BY E. B. KNERR, ATCHISON.

Though the formation of narrow lakes by rivers leaving their old courses and cutting new channels in times of freshet is by no means unusual, yet in the case of large rivers, such as the Missouri, these formations are never without some interesting features.

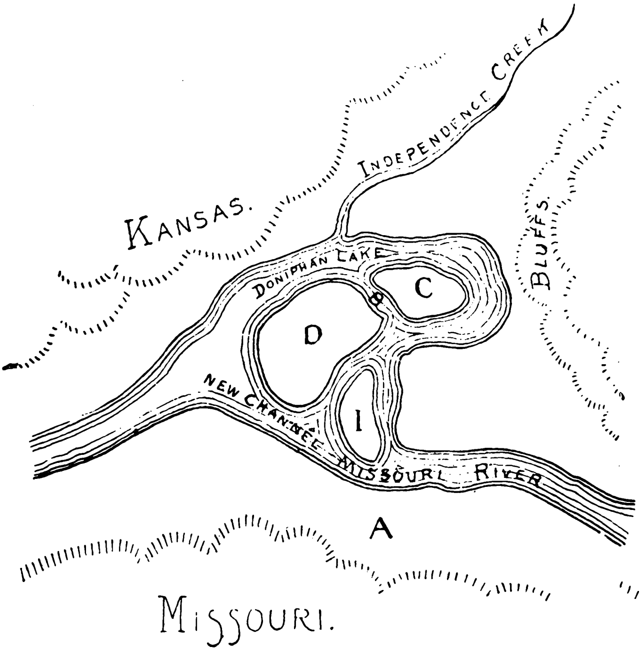

FIG. 13.

Prior to the present year, the Missouri river made quite a detour some five miles north of Atchison, about a point known as "Doniphan point," and each year it kept extending the bend further northward, encroaching quite rapidly upon the site of what was once the thriving little town of Doniphan. Time and again new roads had to be cut further in from the river. But during the early rises of the present year a great change took place which has, for generations at least, dispelled all fears of further encroachments, and which may eventually make of old Doniphan something of a pleasure resort.

By the map, it will be seen that as the river came southward it made a sharp turn toward the west, at *A*, dividing into two branches which soon united, encircling what was known as "The Island" (*I*). The last June rise was unusual for this locality, and the upper branch of the river soon broke over the "point," at *B*, thus forming the first cut-off. But it was not long until the lower portion overflowed the bottoms directly south of it, taking a straight course across the neck and joining the main channel below. Thus, two additional islands, *C* and *D*, were formed, and the old channel to the north of them remained filled with water and constituting the so-called lake. This lake is about four miles in length and, in places, a half to three-fourths of a mile wide. A number of soundings, taken October 9, showed depths varying from 10 to 18 feet. Deposits of sand and mud have about closed up both ends of the lake, but the southern end can never become completely closed, as Independence creek enters about a mile from this end, and will furnish more or less current, especially in time of freshet, thus tending to keep the channel open.

SELECTIVE ABSORTION OF HEAT BY LEAVES.

BY A. G. MAYER, LAWRENCE.

In this research, it was necessary that the thermopile measure with precision down to thousanths of degrees of temperature; it was, therefore, important to cut off all air currents.

The thermopile was incased in two tin boxes, the one outside the other, leaving an air space inclosed by tin all around the instrument; a suitable opening, which could be closed at will with a screen impervious to radiant heat, allowed the heat to fall directly upon the thermopile when desired.

By allowing heat from any source to fall directly upon the thermopile, and then obliging it to pass through a leaf placed in its path, it became possible to determine the effect of the leaf upon the radiant heat.

Experiments were made upon a great many leaves and petals of flowers, and the results were surprisingly alike. As an example, we will cite the case of elm leaves. A single elm leaf in the path of the heat allows only 23.5 per cent. of the radiant heat to pass through it; so 76.5 per cent. is absorbed by the leaf. If now the heat, which has already passed through one leaf, be allowed to pass through a second, we find that the second absorbs only 21.4 per cent. and transmits 78.6 per cent., showing plainly a remarkable selective absorption. A third leaf in the path allows 83 per cent. of the heat which passed through the second leaf to pass through unabsorbed. The transmitting powers of leaves varies from 17.6 to 28.3 per cent. The lower number is for the thick leaves of the mullen, and the higher represents the transmitting power of rose leaves. The transmitting power of various flower petals was as follows: Red rose, 31.2 to 33.3 per cent.; yellow rose, 23.9 per cent.; white rose, 26.6 per cent.; white petals of *Œnothera speciosa*, 26.6 per cent.; petals of purple grass, 30.8 per cent.

Leaves are, therefore, good absorbers of heat, but bodies which are good absorbers are good radiators. The radiation from leaves is about 78, lampblack being 100. We see, then, that were the leaves to radiate their heat at night at this rapid rate they would soon lose much of the energy which they received from the sun dur-